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regions, Greenland "stands highest," with 41 per cent of the Icelandic forms, but the total number of species in Iceland exceeds that of any other arctic region.

GALLØE presents the lichen flora under six aspects: (1) a list of species (284 species in 55 genera); (2) the means of propagation and dispersal; (3) the "biology" under four categories, bark lichens, epiphyllous lichens, earth lichens, and rock lichens; (4) the classification of the lichens into associations; (5) the vertical distribution of the lichens; and (6) the abundance of lichens in Iceland. The classification into associations is based upon the character of the substratum and of the vascular plants. Iceland is shown to have a lichen vegetation poor in species in proportion to its area. Epiphyllous lichens are entirely lacking in such a climate, and bark lichens are scanty in their occurrence. On the contrary, the conditions for the development of earth and rock lichens are better than in the temperate or tropical regions. It follows that, in spite of the rigorous climate, the soil and rocks show a large number of specimens. The lack of data regarding moss development is regretted, and an effort is made to remedy it by presenting the frequency of occurrence according to the RAUNKIAER method.—J. M. C.

MINOR NOTICES

North American flora.—The fourth part of Volume 7 continues the Aecidiaceae by J. C. ARTHUR, who in collaboration with F. D. FROMME presents *Dicaeoma* on Poaceae, 88 of the 269 species listed in the analytical key being included in the present part, 43 of the names being new combinations. The tangle of synonymy involved in such a group is very impressive.—J. M. C.

NOTES FOR STUDENTS

Taxonomic notes.—BRITTON,⁷ in collaboration with several botanists, has published descriptions of 170 new species of Cuban plants, distributed among many families, and including 10 new genera as follows: *Bembicidium* and *Cānizatesia* in Leguminosae; *Ramsdenia*, *Roigia*, and *Dimorphocladium* in Euphorbiaceae; *Cheilophyllum*, *Silvinula*, *Naiadotherix*, and *Anisantherina* in Scrophulariaceae; and *Cotema* in Bignoniaceae.

WILLIAMS,⁸ in anticipation of publication in the *North American flora*, has presented the results of his study of the Calymperaceae, "partly to allow the illustration of cross-sections of the leaves to be issued with the descriptions." This family of mosses includes only the genera *Syrrhopodon* and *Calymperes*, the former containing 18 species (1 new) and the latter 12 species (3 new).

⁷ BRITTON, N. L., Descriptions of Cuban plants new to science. Mem. Torr. Bot. Club 16:57-118. 1920.

⁸ WILLIAMS, R. S., Calymperaceae of North America. Bull. Torr. Bot. Club 47:367-396. pls. 15-17. 1920.

ARTHUR,⁹ in his twelfth paper describing new species of Uredineae, has published 19 new species, 12 of which are under *Aecidium*. In addition, there are several new combinations and new names.

HITCHCOCK¹⁰ has published revisions of the four genera of Paniceae: *Isachne* (8 spp.), *Oplismenus* (4 spp.), *Echinochloa* (7 spp.), and *Chaetochloa* (26 spp.). Full synonymy, often very extensive, and distribution are given in addition to the detailed descriptions. Although no new species are described, there are many transfers.

STANDLEY¹¹ has begun the publication of an account of the trees and shrubs of Mexico, the first paper extending from Gleicheniaceae to Betulaceae, certain families being contributed by specialists. In addition to a general explanatory introduction, there is an interesting history of botanical exploration in Mexico. The Pteridophytes are represented by 28 species, and the Gymnosperms by 56, *Pinus* being credited with 26. The largest genus included is *Agave*, presented by TRELEASE. It is credited with 170 species, 31 of which are described as new. Since 46 other species are credited to TRELEASE, his relationship to the genus is obvious. The next largest genus is *Piper*, with 59 species, the majority of which are credited to the late CASIMIR DE CANDOLLE.

FITZPATRICK¹² has published a detailed monograph of the Coryneliaceae (Perisporiales), the majority of whose species occur only in tropical or subtropical regions. The family includes 14 species, representing 4 genera. The largest genus is *Corynelia*, with 9 species, 5 of which are described as new.

PENNELL¹³ has begun the publication of his studies of the Scrophulariaceae of Colombia, based on an exploration of the region for a period of eight months during 1917 and 1918. The first paper includes the Antirrhinoideae, in which 23 genera are recognized, 2 of them being described as new (*Monocardia* and *Unanuea*). Much the largest genus is *Fagelia*, with 18 species (10 new), all the other 22 genera including 31 species (12 new).

BURT,¹⁴ in his twelfth paper on the Thelephoraceae of North America, presents the genus *Stereum*, recognizing 77 species, 12 of which are new.

⁹ ARTHUR, J. C., New species of Uredineae. XII. Bull. Torr. Bot. Club 47: 465-480. 1920.

¹⁰ HITCHCOCK, A. S., Revisions of North American grasses: *Isachne*, *Oplismenus*, *Echinochloa*, and *Chaetochloa*. Contrib. U.S. Nat. Herb. 22:115-208. pls. 25-32. figs. 21-62. 1920.

¹¹ STANDLEY, P. C., Trees and shrubs of Mexico (Gleicheniaceae-Betulaceae). Contrib. U.S. Nat. Herb. 23:1-169. 1920.

¹² FITZPATRICK, H. M., Monograph of the Coryneliaceae. Mycol. 12:206-267. pls. 12-18. 1920.

¹³ PENNELL, F. W., Scrophulariaceae of Colombia. I. Proc. Acad. Nat. Sci. Philadelphia 72:136-188. 1920.

¹⁴ BURT, E. A., The Thelephoraceae of North America. XII. Ann. Mo. Bot. Gard. 7:81-240. pls. 9. 1920.

The full descriptions, detailed lists of stations, and numerous text cuts leave nothing to be desired in the way of information.

MAXON¹⁵ has described 6 new species of *Selaginella* from southern California, New Mexico, Arizona, and Glacier National Park.

WILDEMAN¹⁶ has published another fascicle of additions to the flora of the Congo, illustrating the abundance of material that continues to be discovered in that interesting territory. A full list of collectors and stations is given, and frequently also full descriptions based upon fresh material. There is also included an account of *Meliola* as represented in the Congo country, with descriptions of new species and varieties, and *Meliolinopsis* is established as a new genus.

ROBINSON,¹⁷ in connection with his study of the Bolivian representatives of *Eupatorium*, has described certain novelties of the tribe. New species are described in *Micania* (19), *Eupatorium* (6), *Ageratum*, and *Alomia*, while *Sphaereupatorium* is established as a new genus and credited to KUNTZE. In the *Eupatoriums* of Bolivia, 68 species are recognized, 29 of which are endemic. In this connection the following statement is made: "The endemism of Bolivia as illustrated by this group is thus about 43 per cent as against about 55 per cent in Peru and 59 per cent in Colombia. After deducting the 29 endemic species, there remain 39 Bolivian *Eupatoriums* which extend to other countries. Of these only 18 are known in Peru, while nearly all the others are species common to south-central Brazil and northern Argentina. Beyond a very few species of wide distribution there is a surprisingly slight common element between the Bolivian and Paraguayan members of the genus, although *Eupatorium* is pretty well represented in both of these contiguous countries."—J. M. C.

Reproduction of Douglas fir forests.—The great importance of the Douglas fir forest region may be appreciated from the estimate by MUNGER¹⁸ that the stand within Washington and Oregon amounts to 560 billion feet of merchantable timber, while the amount in the adjacent forests of British Columbia according to WHITFORD¹⁹ is not less than 350 billion feet. It seems certain that the amount destroyed by comparatively recent fires is almost if not quite

¹⁵ MAXON, W. R., New Selaginellas from the western United States. *Smithson. Miscell. Coll.* 72: no. 5. pp. 10. pls. 6. 1920.

¹⁶ WILDEMAN, E. DE, Additions à la flore du Congo. *Bull. Jard. Bot. Bruxelles* 7: 1-160. 1920.

¹⁷ ROBINSON, B. L., I. Further diagnoses and notes on tropical American Eupatorieae. II. The *Eupatoriums* of Bolivia. *Contrib. Gray Herb. New Series.* no. 61. pp. 80. 1920.

¹⁸ MUNGER, T. T., Forestry in the Douglas fir region. *Amer. Forestry* 26: 199-205. figs. 7. 1920.

¹⁹ WHITFORD, H. N., and CRAIG, R. D., Forests of British Columbia. pp. 409. pls. 28. maps 21. Commission of Conservation, Canada. Ottawa. 1918.